

Claims

- 1) Live attenuated bacterium of the genus *Escherichia*, *Yersinia* or *Salmonella*, said bacterium not having a functional tRNA_{5^{leu}}, for use in a vaccine.
- 5 2) Live attenuated bacterium for use according to claim 1, said bacterium not having a functional tRNA_{5^{leu}} as a result of a mutation in the *leux* gene.
- 10 3) Live attenuated bacterium for use according to claim 1 or 2, wherein said bacterium is selected from the group consisting of *E. coli*, *S. enterica* serotype *typhimurium*, *enteritidis*, *choleraesuis*, *dublin*, *typhi*, *gallinarum*, *abortusovi*, *abortus-equi* or *pullorum*.
- 15 4) Live attenuated bacterium for use according to claim 1-3, characterised in that the mutation comprises an insertion and/or a deletion.
- 5) Live attenuated bacterium for use according to claims 1-4, characterised in that said bacterium carries a heterologous gene.
- 20 6) Live attenuated bacterium for use according to claim 5 characterised in that the heterologous gene is inserted in the *leux* gene.
- 25 7) Live attenuated vaccine for the protection of animals and humans against infection with a pathogenic bacterium or the pathogenic effects thereof, characterised in that said vaccine comprises a bacterium as defined in claims 1-6 and a pharmaceutically acceptable carrier.
- 8) Live attenuated vaccine according to claim 7, characterised in that it comprises an adjuvant.
- 30 9) Live attenuated vaccine according to claim 7 or 8, characterised in that it is in a freeze-dried form.
- 35 10) Use of a live attenuated bacterium as defined in claims 1-6 for the manufacture of a vaccine for the protection of animals against infection with a pathogenic bacterium or the pathogenic effects of infection.

11) Method for the preparation of a vaccine according to claims 7-9, characterised in that said method comprises the admixing of a live attenuated bacterium as defined in claims 1-6 and a pharmaceutically acceptable carrier.